

REMARKS

Claims 1, 3-4, 6-7, 9-10, 12-16, 18-24, and 26-27 are pending in the subject application. In the present Office Action, all pending claims stand rejected. In particular, claims 1, 3-4, 6-7, 9-10, 12-16, and 19-23 stand rejected under 35 U.S.C. 112, second paragraph as assertedly being indefinite. Claims 1, 3-4, 6-7, 9-10, 12-16, 18-24, and 26-27 stand provisionally rejected on the grounds of non-statutory obviousness-type double patenting in view of co-pending U.S. Patent Application Serial No. 10/959,792 (the '792 Application). Claims 1-27 stand rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over U.S. Patent No. 5,358,729 to Ohkuma et al. ("Ohkuma") in combination with Wurzburg, O.B. "Modified Starches: Properties and Uses," CRC Press Inc., 1986, pp 33-34 ("Wurzburg") and U.S. Patent No. 2,287,599 to Bulfer ("Bulfer"). Applicant respectfully traverses the rejections of record as set forth herein.

In the present response, Applicant has amended claims 1, 15, 16, 24, 26, and 27 to replace the term "maximum" with "maximized". Support for this amendment may be found in the specification as published, for example in paragraphs [0030], [0031], [0037], and Figure 1. Applicant has also amended claim 26 to recite "a whiteness level between about 65 and about 100." Support for this amendment may be found the specification as published, for example, at paragraph [0042]. Applicant asserts that no new matter has been added by these amendments.

Rejection under 35 U.S.C. § 112, Second Paragraph

Claims 1, 3-4, 6-7, 9-10, 12-16, and 19-23 stand rejection under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner states that the feature "until a maximum yield of resistant starch has been obtained" is indefinite because it not clear if Applicant intends 100% yield or that the maximum yield could be less than 100%.

Applicant has amended 1, 15, 16, 24, 26, and 27 to replace the term "maximum yield" with the term "maximized yield". This amendment corrects the perceived lack of clarity since one having ordinary skill in the art would understand the

feature to indicate that Applicant's method produces a yield of resistant starch that is maximized but may be less than 100%. Further, one having ordinary skill in the art would understand from reading the claims and the specification that Applicant intends that the yield of resistant starch is maximized (i.e., that is where "greater amounts of resistant starch can be produced while maintaining an acceptable color" (see, paragraph [0030])). For example, by reviewing Figure 1, which illustrates plots showing maximized yields of approximately 62.5%, 59%, and 55.1% for temperatures of 170°C, 150°C, and 140°C, respectively, one having ordinary skill in the art would recognize that the yields of resistant starch are maximized at a particular nexus between temperature and pH. Applicant believe that the amendment renders the rejected claims clear and respectfully requests that the rejection of the claims under 35 U.S.C. § 112, second paragraph, be withdrawn.

Double Patenting

Claims 1, 3-4, 6-7, 12-16, 18, 20-24, and 26-27 stand provisionally rejected under non-statutory obviousness-type double patenting as being unpatentable over claims 1-7, 12-15, 18-23, 26-31, and 33-34 of co-pending, commonly owned U.S. Application Serial No. 10/959,792 (the '792 application).

Applicant respectfully disagrees with the Examiner's provisional rejection over the '792 application. The priority date of the '792 application (October 6, 2004) is later than the priority date of the subject application (February 20, 2003). Thus, the filing of a terminal disclaimer in the subject application, as suggested by the Examiner, only serves to disclaim patent term of the '792 application that is necessarily already beyond the longest possible patent term of the subject application. However, since the subject application and the '792 applications are commonly owned by assignee Archer-Daniels-Midland Company and to progress the subject application toward allowance, Applicant submits herewith the requested terminal disclaimer in compliance with 37 C.F.R. §1.321 to overcome the provisional rejection based on non-statutory obviousness-type double patenting. In view of the terminal disclaimer enclosed herewith, Applicant respectfully requests that the provisional rejection be withdrawn.

Rejection under 35 U.S.C. § 103(a)

Claims 1-27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohkuma in combination with Wurzburg and Bulfer. Applicant traverses the rejection as set forth herein.

To establish a case for *prima facie* obviousness, three basic criteria must be met: a) there must be some suggestion or motivation to modify the reference or to combine the reference teachings; b) there must be a reasonable expectation of success; and c) the prior art reference(s) must teach or suggest all the claim limitations. MPEP 2143. Applicant submits that *prima facie* obviousness has not been established for at least the reasons that there is no suggestion or motivation to combine the reference teachings and the prior art reference(s) do not teach or suggest all the claim limitations. Further, it is submitted by Applicant that the cited references teach away from the claims of the subject application.

The Examiner states that the Ohkuma reference teaches a process for producing a starch having a whiteness range of 12.3 to 66 (Ohkuma, Table 13, column 23, lines 24-36). As noted by the Examiner, Ohkuma specifically teaches an inverse relationship between the whiteness of the starch product and the heating temperature or heating time (Office Action, page 5). "The whiteness decreased generally in inverse proportion to the heating temperature or heating time." (Ohkuma, column 23, lines 38-39). Close inspection of Table 13 reveals that the Ohkuma process produces a maximum whiteness of 50.5 within the temperature range of 140°C to 180°C, specifically at the temperature of 140°C. Ohkuma does not teach or suggest that whiteness levels between about 60 to about 100 can be achieved at reaction temperature of about 140°C to about 180°C, as set forth in the claims of the subject application. Indeed, based on Ohkuma's observation of the inverse relationship between whiteness and temperature, the reference specifically teaches away from whiteness levels above 50.5 at temperatures above 140°C. One having ordinary skill in the art, reading Ohkuma (alone or in combination with other references), would not be motivated to conduct the Ohkuma process at temperatures of between about 140°C to about 180°C and receive whiteness levels between about 60 and about 100.

In addition, Ohkuma does not teach or suggest selecting an optimum pH of about 1 to about 4 and temperature of about 140°C to about 180° at which a maximized yield of resistant starch is obtained while maintaining a whiteness level between about 60 and about 100. Indeed, there is no teaching or suggestion in Ohkuma that pH can affect the whiteness of the starch product. Figures 2 and 3, cited by the Examiner as showing a correlation between degree of coloration and pH, do not illustrate a connection between pH and coloration during starch formation. Instead, Figures 2 and 3 demonstrate the effect of pH on the subsequent color of the already formed starch of Ohkuma. Specifically, the starch product used as the starting material of Experimental Example 14 (Ohkuma, column 35, lines 18-21) was produced by the Ohkuma process, but further decolorized with charcoal twice (see Example 6, column 34, lines 8-13, describing the production of the starch starting material for Experimental Example 14) before being combined with glycine and heated at pH 4.5 or 6.5 to determine how the coloration of the formed starch changes when mixed with a food product (resulting in Figures 2 and 3). One having ordinary skill in the art would not read Ohkuma as teaching or suggesting that there is a nexus between the reaction temperature and pH during starch formation at which a maximized yield of resistant starch is obtained having the claimed whiteness levels.

The Examiner cites to Wurzburg as teaching that the color of dextrin ranges from near white to dark brown and is an indication of the temperature to which the starch is exposed during dextrinization and is also influenced by the acidity of the starch. However, Wurzburg discloses that there is no common pattern reflecting differences in conversion temperature and pH for the different types of starches (Wurzburg, page 34, section E and #3, last sentence). Wurzburg provides no information on how color is influenced by temperature or pH, nor does Wurzburg disclose how dextrans having a whiteness level of about 60 to about 100 may be formed. Further, Wurzburg does not disclose or suggest: selecting a reaction temperature of about 140°C to about 180°C, acidifying unmodified starch to a pH of about 1 to about 4, and/or a nexus between temperature and pH which is optimum to convert the unmodified starch to resistant starch at which a maximized yield is obtained while maintaining a whiteness level between about 60 and about 100. Wurzburg, alone or in

combination with Ohkuma and/or Bulfer, does not teach or suggest the element of the claims nor is there motivation or suggestion to combine the teaching of Wurzburg with Ohkuma and/or Bulfer.

The Examiner cites to Bulfer as teaching a method for producing a resistant white starch via an acidification process at a temperature range of 94 to 177°C and a pH of 2.7. First, Bulfer only teaches a maximum temperature of 149°C (300°F) and does not disclose the whiteness level of the starch produced. However, Bulfer notes that when the conversion is at a lower temperature (i.e., less than 149°C), there is “less danger of charring and the formation of black specks.” (Bulfer, page 1, column 2, lines 42-47). Further, as noted by the Examiner, Bulfer teaches the use of a combination of monochloroacetic acid and chlorine to affect the starch formation and specifically teaches away from the use of hydrochloric acid. For example, Bulfer states “the monochloroacetic acid-chlorine converted product has superior qualities in comparison with that made with hydrochloric acid as the converting agent. ... The paste and film deposited therefrom are whiter and film has a higher gloss or luster.” (Bulfer, page 1, column 2, lines 31-41). According to the MPEP and the Court of Appeals for the Federal Circuit, “[a] prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention.” (MPEP 2141.02, citing *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983)). One having ordinary skill in the art would not be motivated to combine the teaching of Ohkuma (using hydrochloric acid) with that of Bulfer (teaching away from using hydrochloric acid) to give the claims of the subject application.

In addition to the above, Applicant notes that the dependent claims further define the invention outside the limitations of the art cited against them. For example, claims 9, 10, 18, 19, and 20 recite reaction temperatures and whiteness levels outside the whiteness levels achieved at the recited temperatures in Ohkuma and outside the maximum temperature used in Bulfer (i.e., 149°C). *Prima facie* obviousness of the dependent claims has also not been established.

Applicant has shown that a *prima facie* case of obviousness has not been established by the combination of Ohkuma with Wurzburg and Bulfer. First, the combined references do not teach or suggest each and every element of the claimed

invention. Second, the Ohkuma reference specifically teaches away from the use to the claimed temperatures to give the claimed whiteness levels. Finally, one having ordinary skill in the art would not be motivated to combine the teachings of the cited references and, indeed, the references teach away from any such combination. Moreover, the cited art fails to disclose the selection of pH that is optimum to convert the unmodified starch to resistant starch when at the reaction temperature to afford a maximized yield of resistant starch while maintaining the claimed whiteness levels. Applicant respectfully requests that the rejection of the claims under 35 U.S.C. § 103(a) be withdrawn.

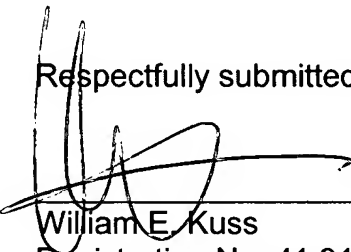


CONCLUSION

Applicants submit that claims 1, 3-4, 6-7, 9-10, 12-16, 18-24, and 26-27 of the subject application recite novel and non-obvious methods for producing a resistant starch. In view of the amendments and remarks presented above, Applicants respectfully submit that the subject application is in condition for allowance. Accordingly, reconsideration of the rejections and allowance of all pending claims is earnestly solicited.

If the undersigned can be of assistance to the Examiner in addressing issues to advance the application to allowance, please contact the undersigned at the number set forth below.

Respectfully submitted,



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